

COMMISSION ACTION FORM

**SUBJECT: ZONING ORDINANCE AND SUBDIVISION REGULATIONS TEXT AMENDMENTS PERTAINING TO SOURCE WATER PROTECTION**

**BACKGROUND:**

A primary responsibility of the Water and Pollution Control Department is to ensure an adequate source water supply for the City of Ames and to protect existing wells from known sources of contamination. Of particular concern is the Southeast Well field (See *attached Map A*) and Youth Sports Complex well field (See *attached Map B*). These well fields are comprised of a shallow, unconfined alluvial aquifer that has minimal overburden protecting it from contamination.

Currently, Ames Municipal Code Chapters 23 (Subdivisions) and 29 (Zoning) require all new developments within the City to meet storm water design requirements that prohibit an increase in the rate of runoff for 5-year, 10-year, 50-year, and 100-year design storm events. This is typically accomplished by constructing storm water detention basins. Iowa Department of Natural Resources (IDNR) separation criteria for new wells require 1,000 feet from any lagoons.

Based on past correspondence regarding the Super Wal-Mart site development and more recent correspondence with IDNR, any storm water detention or bioswale that is subject to contamination from storm water would be required to meet the same site separation distance as a lagoon. If an existing well were to fail, the City would not be allowed to re-drill a replacement well within 1,000 feet of a storm water detention basin. Super Wal-Mart was required to be platted and storm water quantity requirements were **waived** in lieu of storm water quality requirements as agreed upon by the developer and City staff and approved by City Council. Super Wal-Mart's bioswale is designed to only take rooftop water and is not considered a potential contaminant source.

Recently, a proposed development at 205 Southeast 5<sup>th</sup> Street (PETCO, Inc.) came before the City's Development Review Committee and staff determined that a minor site plan was required. In order to waive storm water quantity requirements, the developer applied for a variance from the Zoning Board of Adjustment (ZBA). The ZBA subsequently denied PETCO's request to waive the requirement. In that instance, the developer could likely meet storm water quantity requirements but was working informally with City staff to address concerns over wellhead protection which prevented storm water detention. Currently, there is nothing in either the zoning code or subdivision code that addresses the ability to use storm water quality in lieu of storm water quantity in these areas of concern.

Ames water utility customers have invested into our source water infrastructure, and the purpose of a proposed text amendment is to continue to protect that investment. There are three main goals of a proposed text amendment to both Chapter 23 and Chapter 29:

1. Put protective measures into place based on requirements in the Iowa Administrative Code [567] Chapter 43 that preserves the ability to re-drill a well in the same location in the Southeast and Youth Sports Complex Well Fields. (See *attachments for Iowa Administrative Code*)
2. Allow coordination between Public Works, Planning & Housing, and Water & Pollution Control to provide more clarification to developers on storm water requirements within this area of concern and allow storm water quality-based treatment in lieu of storm water quantity-based treatment or some appropriate combination.
3. Allow development to occur along South Duff Avenue corridor without jeopardizing the long-term water supply for the community.

In order to meet these goals, the proposed language for Chapter 23 (Subdivisions) is as follows (underlined is new text):

#### **Sec 23.401 SITE DESIGN STANDARDS**

- (8) Water Supply Protection: In order to protect the existing and future source water supply for the city, the following improvements and uses will be prohibited within a 1,000-foot distance from any City of Ames drinking water well located in the Southeast Well Field and Youth Sports Complex Well Field.
- (a) Including, but not limited to, borrow areas, pits, ponds, fountains, lagoons, storm water detention ponds, and mining operations.
  - (b) Permanent excavation below existing grade. Temporary excavation will be allowed for certain purposes. These include, but are not limited to, footings, basements, and installation of utilities.

In addition, any proposed improvement or use shall not be in violation of separation criteria for sources of contamination specifically listed in Table A, 567, Iowa Administrative Code section 43.3(7).

#### **Sec. 23.407 STORM WATER MANAGEMENT**

- (2) Storm Water Management Design Standards: Storm water management design shall include grading, facilities or improvements or some combination thereof, which results in no increase in the rate of runoff when compared to the undeveloped condition of the area to be subdivided. The rainfall frequencies that shall be incorporated in the design of the storm water management system shall include the five year, ten year, 50 year, and 100 year design storm events. In the case of major subdivisions, the calculations

and design of the storm water management system shall be prepared by an engineer licensed to practice in Iowa.

- (a) Exemption. Storm Water Management Design standards do not apply to any area within a 1,000-foot distance from any City of Ames drinking water well located in the Southeast Well Field and Youth Sports Complex Well Field. In these specific areas, developments will need to meet requirements for storm water quality-based treatment or a combination of quantity- and quality-based treatment, as approved by both the Director of Public Works and the Director of Water and Pollution Control.

The same language will be utilized in Chapter 29 (Zoning). This will make this applicable to developments that do not meet the major or minor subdivision criteria.

### **Sec. 29.406 OFF STREET PARKING**

#### **(11) Improvements of Off-Street Parking Areas.**

- (c) Storm Water Management Design Standards: Storm water management design shall include grading, facilities or improvements or some combination thereof which results in no increase in the rate of runoff when compared to the undeveloped condition of the area to be developed. The rainfall frequencies that shall be incorporated in the design of the storm water management system shall include the five year, ten year, 50 year and 100 year design storm events. The calculations and design of the storm water management system shall be prepared by an engineer licensed to practice in Iowa.

*(Ord. No. 3591, 10-10-00)*

- (i) Exemption. Storm Water Management Design standards do not apply to any area within a 1,000-foot distance from any City of Ames drinking water well located in the Southeast Well Field and Youth Sports Complex Well Field. In these specific areas, developments will need to meet requirements for storm water quality-based treatment or a combination of quantity- and quality-based treatment, as approved by both the Director of Public Works and the Director of Water and Pollution Control.

### **Sec. 29.408 OTHER GENERAL DEVELOPMENT STANDARDS**

- (8) Water Supply Protection. In order to protect the existing and future source water supply for the city, the following improvements and uses will be prohibited within a 1,000-foot distance from any City of Ames drinking water well located in the Southeast Well Field and Youth Sports Complex Well Field.

- (a) Including, but not limited to, borrow areas, pits, ponds, fountains, lagoons, storm water detention ponds, and mining operations.

(b) Permanent excavation below existing grade. Temporary excavation will be allowed for certain purposes. These include, but are not limited to, footings, basements, and installation of utilities.

In addition, any proposed improvement or use shall not be in violation of separation criteria for sources of contamination specifically listed in Table A, 567, Iowa Administrative Code section 43.3(7).

One main issue brought up at the Zoning Board of Adjustment meeting was that, by waiving storm water quantity requirements for the 205 Southeast 5<sup>th</sup> Street development, site flooding downstream on other properties would occur. Staff has reviewed the merits of this issue and feel that, because of the limited amount of developable area affected by the proposed ordinance and the proximity to the South Skunk River, waiving the storm water quantity requirement would have little to no effect on flooding downstream during minor storm events, which is where detention has the most effect this close to the floodplain.

Another possible concern is the cost of doing storm water quality based treatment. Staff is in the beginning stages of requiring both storm water quantity- and quality-based management for all new developments, so this may become the standard in the near future for the City of Ames. Thus, the cost of development due to this ordinance revision will be minimal.

**Land Use Policy Plan.** (See *attachments for full text*) As evidenced in the Land Use Policy Plan, Goals for a New Vision, in Chapter 1, Planning Base, Goal #3, (page 16) objective 3.C., it is the City of Ames' intention to protect aquifers:

“Ames seeks to protect and conserve its water resources for the following purposes: aquifer protection; water quality protection; user conservation management; plant and animal life support; water-borne recreation; scenic open space; and, provision of a long-term/reliable/safe source of water for human consumption and economic activities.”

And also in Chapter 4, Environmental (page 76), it is the City of Ames intention to further develop regulations that are more site specific in protecting aquifers:

“With respect to water resources, more detailed Storm water Management Planning on a watershed level will likely be needed. To protect the water resources, mitigation measures such as storm water quality ponds and other Best Management Practices will be required as development within a watershed occurs.”

## **ALTERNATIVES:**

1. The Planning and Zoning Commission can recommend that the City Council adopt the text amendments as described above.
2. The Planning and Zoning Commission can recommend that the City Council adopt the text amendments described above, but with modifications.
3. The Planning and Zoning Commission can recommend that the City Council not adopt the proposed text amendments.
4. The Planning and Zoning Commission can refer this issue to staff for further information.

## **RECOMMENDED ACTION:**

It is important that the City take appropriate efforts to protect the community's source water supply. Amendments to these two chapters will provide protection of our current and potential future investments in source water, while at the same time allow for continued development along the South Duff Avenue corridor. The proposed ordinance revisions seek a balance between source water protection, storm water management, and continued development. The proposed amendment implements the policies of source water protection within the Land Use Policy Plan that have thus far, been unclear to the development community.



Therefore, it is the recommendation of staff that the Planning and Zoning Commission adopt Alternative No. 1, thereby recommending approval of the text amendments to Ames Municipal Code Chapters 23 (Subdivisions) and Chapter 29 (Zoning).

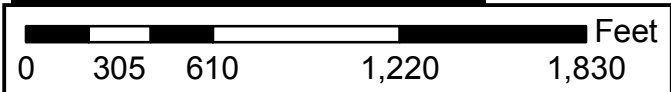
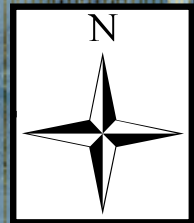


# Map A: Southeast Well Field



**Legend**

-  Floodway Boundary
-  1,000 ft Setback Radius





07/07/2009

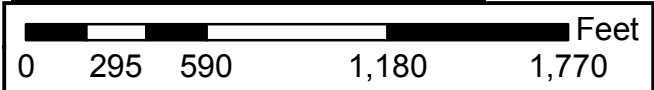
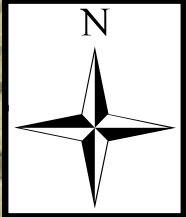


# Map B: Youth Sports Complex Well Field



**Legend**

-  Floodway Boundary
-  1,000 ft Setback Radius



07/07/2009

## Iowa Administrative Code Excerpt #1

*b.* The department may reject receipt or delay review of the plans and specifications until an adequate basis of design is received.

**43.3(6) *Standard specifications for water main construction.*** Standard specifications for water main construction by an entity may be submitted to the department or an authorized local public works department for approval. Such approval shall apply to all future water main construction by or for that entity for which plans are submitted with a statement requiring construction in accordance with all applicable approved standard specifications unless the standards for public water supply systems specified in 43.3(2) are modified subsequent to such approval and the standard specifications would not be approvable under the modified standards. In those cases where such approved specifications are on file, construction may commence 30 days following receipt of such plans by the department or an authorized local public works department if no response has been received indicating construction shall not commence until a permit is issued.

**43.3(7) *Site, separation distance, and monitoring requirements for new raw water source(s) and underground finished water storage facilities.***

*a. Approval required.* The site for each proposed raw water supply source or finished water below-ground level storage facility must be approved by the department prior to the submission of plans and specifications.

*b. Criteria for approval.* A site may be approved by the director if the director concludes that the criteria in this paragraph are met.

(1) Groundwater source. Wells shall be planned and constructed to adapt to the geologic and groundwater conditions of the proposed well site to ensure production of water from the wells that is both microbially safe and free of substances that could cause harmful human health effects. Groundwater wells must meet the following requirements:

1. Drainage must be directed away from the well in all directions for a minimum radius of 15 feet.

2. A well site must be separated from contamination sources by the distances specified in Table A at a minimum.

3. After the well site has received preliminary approval from the department, the owner of the proposed well must submit proof of legal control of the land for a 200-foot radius around the well, through purchase, lease, easement, ordinance, or other similar means. Proof of legal control must be submitted as part of the construction permit application, prior to construction. The legal control must be maintained by the public water system for the life of the well, and the system must ensure that the siting criteria indicated in Table A are met.

However, if the proposed well is for an existing noncommunity water system and is replacing an existing well that either does not meet the current standards or is in poor condition, the requirement of 200-foot legal control may be waived by the department provided that:

- The proposed well is located on the best available site;
- The existing facility does not have adequate land to provide the 200-foot control zone;
- The owner has attempted to obtain legal control without success; and
- There is no other public water supply available to which the supply could connect.

4. When the proposed well is located in an existing well field and will withdraw water from the same aquifer as the existing well(s), individual separation distances may be waived if substantial historical data are available indicating that no contamination has resulted.

5. No well shall be constructed within the projected plume of any known anthropogenic groundwater contamination without the department's written approval. The department may allow a well to be constructed within a contamination plume if the applicant can provide adequate treatment to ensure that all drinking water standards are met and that the pumpage of the proposed well will not cause migration of the plume such that it impacts the water quality of other nearby wells. The applicant must demonstrate, using a hydrogeologic model acceptable to the department, that the time of transport is greater than two years for a viral, bacterial, or other microorganism contaminant and greater than ten years for all chemical contaminants. At a minimum, modeling of the projected plume must take into account the proposed pumpage rate of the well. The department may require additional construction standards for these situations to ensure protection of the groundwater from contamination.



Iowa Admin Code Excerpt #2 (2 pages)

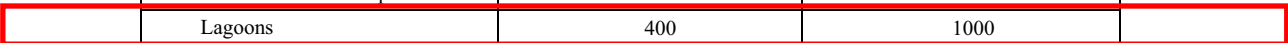
demand, dissolved oxygen, surfactants, nitrogen series (organic, ammonia, nitrite, and nitrate), and phosphate.

TABLE A: SEPARATION DISTANCES

SOURCE OF CONTAMINATION	REQUIRED MINIMUM DISTANCE FROM WELL, IN FEET	
	Deep Well <sup>1</sup>	Shallow Well <sup>1</sup>
<b>WASTEWATER STRUCTURES:</b>		
Point of Discharge to Ground Surface		
Sanitary & industrial discharges	400	400
Water treatment plant wastes	50	50
Well house floor drains	5	5
<b>Sewers &amp; Drains<sup>2</sup></b>		
Sanitary & storm sewers, drains	0 – 25 feet: prohibited 25 – 75 feet if water main pipe 75 – 200 feet if sanitary sewer pipe	0 – 25 feet: prohibited 25 – 75 feet if water main pipe 75 – 200 feet if sanitary sewer main pipe
Sewer force mains	0 – 75 feet: prohibited 75 – 400 feet if water main pipe 400 – 1000 feet if water main or sanitary sewer pipe	0 – 75 feet: prohibited 75 – 400 feet if water main pipe 400 – 1000 feet if water main or sanitary sewer main pipe
Water plant treatment process wastes that are treated onsite	0 – 5 feet: prohibited 5 – 50 feet if sanitary sewer pipe	0 – 5 feet: prohibited 5 – 50 feet if sanitary sewer main pipe
Water plant wastes to sanitary sewer	0 – 25 feet: prohibited 25 – 75 feet if water main pipe 75 – 200 feet if sanitary sewer pipe	0 – 25 feet: prohibited 25 – 75 feet if water main pipe 75 – 200 feet if sanitary sewer main pipe
Well house floor drains to sewers	0 – 25 feet: prohibited 25 – 75 feet if water main pipe 75 – 200 feet if sanitary sewer pipe	0 – 25 feet: prohibited 25 – 75 feet if water main pipe 75 – 200 feet if sanitary sewer main pipe
Well house floor drains to surface	0 – 5 feet: prohibited 5 – 50 feet if sanitary sewer pipe	0 – 5 feet: prohibited 5 – 50 feet if sanitary sewer main pipe
<b>Land Disposal of Treated Wastes</b>		
Irrigation of wastewater	200	400
Land application of solid wastes <sup>3</sup>	200	400
<b>Other</b>		
Cesspools & earth pit privies	200	400
Concrete vaults & septic tanks	100	200
Lagoons	400	1000
Mechanical wastewater treatment plants	200	400
Soil absorption fields	200	400
<b>CHEMICALS:</b>		
Chemical application to ground surface	100	200
Chemical & mineral storage above ground	100	200
Chemical & mineral storage on or under ground	200	400
Transmission pipelines (such as fertilizer, liquid petroleum, or anhydrous ammonia)	200	400

(Shallow well: <400 feet deep)

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SOURCE OF CONTAMINATION	REQUIRED MINIMUM DISTANCE FROM WELL, IN FEET	
	Deep Well <sup>1</sup>	Shallow Well <sup>1</sup>
ANIMALS:		
Animal pasturage	50	50
Animal enclosure	200	400
Earthen silage storage trench or pit	100	200
Animal Wastes		
Land application of liquid or slurry	200	400
Land application of solids	200	400
Solids stockpile	200	400
Storage basin or lagoon	400	1000
Storage tank	200	400
MISCELLANEOUS:		
Basements, pits, sumps	10	10
Cemeteries	200	200
Cisterns	50	100
Flowing streams or other surface water bodies	50	50
Railroads	100	200
Private wells	200	400
Solid waste landfills and disposal sites <sup>4</sup>	1000	1000

<sup>1</sup> Deep and shallow wells, as defined in 567—40.2(455B): A deep well is a well located and constructed in such a manner that there is a continuous layer of low permeability soil or rock at least 5 feet thick located at least 25 feet below the normal ground surface and above the aquifer from which water is to be drawn. A shallow well is a well located and constructed in such a manner that there is not a continuous layer of low permeability soil or rock (or equivalent retarding mechanism acceptable to the department) at least 5 feet thick, the top of which is located at least 25 feet below the normal ground surface and above the aquifer from which water is to be drawn.

<sup>2</sup> The separation distances are dependent upon two factors: the type of piping that is in the existing sewer or drain, as noted in the table, and that the piping was properly installed in accordance with the standards.

<sup>3</sup> Solid wastes are those derived from the treatment of water or wastewater. Certain types of solid wastes from water treatment processes may be land-applied within the separation distance on an individual, case-by-case basis.

<sup>4</sup> Solid waste means garbage, refuse, rubbish, and other similar discarded solid or semisolid materials, including but not limited to such materials resulting from industrial, commercial, agricultural, and domestic activities.

**43.3(8) Drinking water system components.** Any drinking water system component which comes into contact with raw, partially treated, or finished water must be suitable for the intended use in a potable water system. The component must meet the current American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 61 specifications, if such specification exists for the particular product, unless approved components are not reasonably available for use, in accordance with guidance provided by the department. If the component does not meet the ANSI/NSF Standard 61 specifications or no specification is available, the person seeking to supply or use the component must prove to the satisfaction of the department that the component is not toxic or otherwise a potential hazard in a potable public water supply system.

**43.3(9) Water treatment filter media material.** For single media filters, grain sizes up to 0.8 mm effective size may be approved for filters designed to remove constituents other than those contained in the primary drinking water standards. Pilot or full-scale studies demonstrating satisfactory treatment efficiency and operation with the proposed media will be required prior to issuing any construction permits which allow filter media sizes greater than 0.55 mm.

**43.3(10) Best available treatment technology.**

a. *BATs for organic compounds.* The department identifies as indicated in the table below either granular activated carbon (GAC), packed tower aeration (PTA), or oxidation (OXID) as the best available



View to the south of undeveloped  
Planning Area and U.S. Highway 30  
crossing south of the ISU Dairy Farm

**Goal No. 3.** It is the goal of Ames to assure that it is an “environmentally-friendly” community and that all goals and objectives are integrated with this common goal. In continuing to serve as a concentrated area for human habitat and economic activity, Ames seeks to be compatible with its ecological systems in creating an environmentally sustainable community.

Objectives. In assuring the community’s “environmental-friendliness”, Ames seeks the following objectives.

- 3.A. Ames seeks to provide biodiversity through the inclusion of plant and animal habitats. Their inclusion shall be provided through such methods as conservation management, protection, replacement, etc.
- 3.B. Ames seeks to maintain and enhance the value of its stream corridors as drainageways and flood management areas, plant and animal habitats, recreational and scenic areas, and pathways for linking the overall community.

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- 3.C. Ames seeks to protect and conserve its water resources for the following purposes: aquifer protection; water quality protection; user conservation management; plant and animal life support; water-borne recreation; scenic open space; and, provision of a long-term/reliable/safe source of water for human consumption and economic activities.

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- 3.D. Ames seeks to protect and conserve its energy sources for the following purposes: energy consumption reduction through provision of an integrated multi-modal transportation system, and through land use practices that minimize vehicular trips; user conservation management; material recycling; and, long-term/reliable/safe source for the support of human and economic activities.

**Natural Resource Recommendations.** The corridors that these resources occupy should provide a connected and continuous greenway. These corridors benefit existing wildlife by protecting their habitat, and they also offer a means of linking the community with a linear park system that would benefit all residents. These corridors can provide safe pedestrianways and bikeways that can increase the cohesion of neighborhoods and the surrounding communities.

Water quality is also a concern for Ames. The Skunk River, the Squaw Creek, their tributaries and Halletts Quarry, are part of a complex system of watersheds that function to convey surface water through the area. All of these rivers and streams and the quarry north of the City are linked to the groundwater aquifer from which the City obtains its potable water supply. With the increase of urban and agricultural development, runoff increases, proportionately. As runoff increases, so does the level of pollutants. Existing resources provide a buffer to water resources. These buffers reduce runoff and filter out pollutants.

The Future Land Use Map identifies Environmentally Sensitive Areas that include selected natural resources and flood-prone areas to be protected.

With respect to water resources, more detailed Stormwater Management Planning on a watershed level will likely be needed. To protect the water resources, mitigation measures such as stormwater quality ponds and other Best Management Practices will be required as development within a watershed occurs.

Where selected natural resources are included in Village Residential, they should be incorporated as part of the required open space. Where natural resources cannot be protected as part of open space requirements in new development, the City (or some private conservancy group) should seek their protection through acquisition, leasing or development transfer provision.